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ABSTRACT

The most popular application of computers in the classroom is word processing. Essex County College in Newark, New Jersey, was one of the first institutions to teach students to write with the computer. Using computers in education provides the following benefits: (1) students find it easier to make changes when writing with the computer than when writing with pen and paper--thus, they tend to rewrite more to improve their writing; (2) the computer can act as instructor or tutor (using programmed instruction, for example, or hypertext); (3) computers make students learn differently, demanding that the user (the student) supply information and become involved; and (4) immense amounts of information can be stored in a small amount of space and be retrieved in seconds. (SR)

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Computers make mark on teaching of writing

The writer is a professor of English at Essex County College.

By HOWARD POTEET

Although nearly everyone knows students use computers in classrooms, few people realize how much computers have revolutionized education.

Matthew B. Miles pointed out in the book "Innovations in Education" that it takes at least 50 years for almost anything new to be adapted to the curriculum. An excellent case in point is the use of the computer. It was way back in 1939 that scientists plugged in the Mark I (the first modern computer), which was used exclusively for "number crunching" (making advanced mathematical calculations) by professional statisticians.

It took 50 years, just as Miles predicted, for the computer to be introduced into the classroom. And, then, surprisingly, its most popular application has turned out to be word processing—not calculating.

Essex County College in Newark was one of the first institutions of higher education to teach students to write with the computer. In fact, research into the use of the computer in education was carried out there when the school opened in 1968. To put that into historical perspective, it was not until the mid-1980s that other colleges and universities throughout New Jersey began to use computers in composition classes. Today, most college students all over the country use computers in one way or another.

Is computer-based education effective? In English classes, the answer is yes. Most researchers have found that students tend to improve their writing in computer-enhanced courses.

This is not to say that academic acceptance of the computer is universal; there are still instructors who do not hold with electrical appliances that write. But in general, those of us who try to optimize their use have found that using computers in education provides the following benefits:

• Students find it is easier to make changes when writing with the computer than when writing with pen and paper; thus, they tend to rewrite more to improve their writing.

This is because word processing software can turn a computer into a sophisticated typewriter which simplifies the tasks of making corrections, moving text into different order and inserting or substituting words. All such changes are made electronically; nothing needs to be retyped. Furthermore, spelling and grammar checkers can be used to help students make corrections and turn out readable prose.

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But there is another more dramatic way to use the computer to improve writing. Its greatest help is with students who have been cheated out of a knowledge of basic skills by an incompetent educational system.

These students who lack basic skills often want to do well but don't know what they are supposed to do. The reason they lack an understanding of the basics of how language works is they have not read or written enough and have not developed intuitions on their own.

The computer can and does help such students because it provides a unique way for them to develop those missing skills. The promising technique is the use of software which measures the readability of writing. Readability is a score based on the ratio of the sentence length and word length of a piece of writing. Research shows that a readability score is a valid and reliable way to measure whether or not writing can be easily understood.

But, although such formulas have been used in creating textbooks which are intended for use by students at varying grade levels, this idea has not been used in the teaching of writing until fairly recently. And that pioneering work has been carried on at Essex County College.

As to the specifics of how and why readability scores can be used to improve writing, one needs to understand that research shows that, in general, writing is improved through rewriting. Yet, students who attempt to rewrite often have little or no idea of what to change.

As a way of seeing what needs to be altered, students rewrite their work to achieve a desired readability level. Since they usually must change sentence length and select different words to do this, they thus achieve facility in using different sentence structures and expand their vocabulary.

In revising in this manner, they work with what the linguists call the "deep structure" of the language. And, in so doing, they find that there are many ways to say what they want to say. As a result, they begin to see consciously what it is that the instructor feels, subconsciously or intuitively, when he or she says that some statements are awkward.

• The computer can act as instructor or tutor. Tutorial software offers individually paced instruction. One method is programmed instruction (which breaks complicated matter down into a series of simple steps). Another is hypertext, which lets the learner jump from one subject to another in a nonlinear fashion—the way the human mind seems to work.

Other ways of teaching are now being developed through AI (artificial intelligence) techniques such as expert systems (which use deductive reasoning

to solve problems) and neural networks (which can "train" the computer to think in a rudimentary manner). These systems offer potential for computer-based instruction undreamed of just a few years ago. As an example of what can be achieved through these new techniques, one AI software program teaches typing by analyzing mistakes and continuously changes practice drills stored in its memory to suit the needs of individual students.

However, the real changes in learning created by computer use are far more important. No one seems to notice that computers make students learn differently. I'm not just speaking of the obvious such as the student learning to be more precise because machines demand exact commands. Instead, I want to point out that computer-use is altering, perhaps forever, the way students learn.

To understand this, one needs to re-examine an idea popular a quarter of a century ago. In the 1960s, a Canadian professor, Marshall McLuhan, created some interesting insights into the ways in which media affect us. McLuhan said that there were two types of media which he termed "hot" and "cool." The images of "hot" media, he said, such as film, are highly defined and require only that we watch as spectators; we do not need to get involved with them.

Television, on the other hand, is a "cool" medium, in McLuhan's terms, which means its images are not clearly defined. In other words, since a TV picture consists of thousands of dots on the face of a cathode tube, the viewer subconsciously connects them to find a meaningful image. Doing this means the viewer interacts with the medium and becomes directly involved with what he or she sees.

McLuhan used this theory to suggest, among other things, that our views on Vietnam were altered because we viewed this war on television and thus interacted subconsciously but intensely with its images.

In short, he pointed out that the medium itself is more important than the message that it conveys. This idea he summed up in the memorable phrase, "The medium is the message."

McLuhan died before PCs became popular and, thus, probably didn't have time to apply his ideas to the computer. In fact the computer as most people know it today did not exist while McLuhan was alive. Until the early 1980s, computer communication was done via typewriter keyboards. The change to using the CRT Cathode Ray or Tube or monitor in personal computers was probably more important than most people realize.

The reason is that the CRT, like the TV tube, demands that the user supply information and become involved. Thus, the computer, too, is a cool medium, perhaps the coolest of media. And it is this involvement that is changing and will change education more than any of us can possibly realize.

• Immense amounts of information can be stored in a small amount of space and can be retrieved in seconds. Information is more accessible than ever before.

One popular commercially available CD-ROM disk contains a total of 450 classic books; others contain encyclopedias, atlases, research texts, historical documents, novels, poems and plays.

There are other ways in which computers are being used, and new uses are being discovered each day. Some applications are obvious such as desk-top publishing. Thanks to software which makes it easy to turn typewritten copy into typeset pages, students can enhance the appearance of their text.

Further, publication of student writing apparently adds to their sense of achievement and encourages writing.